Delta Risk Management Strategy
Definitions and Assumption for the Risk Analysis

BACKGROUND

On February 22, 2005 Assembly Member Laird Introduced AB 1200 (An act to add Sections 139.2 and 139.4 to the Water Code), relating for the Sacramento-San Joaquin Delta which was passed by the Senate on August 31, 2005 and by the Assembly on September 1, 2005. Excerpts of the legislative counsel's digest are presented below.

"…This bill would require the Department of Water Resources to evaluate the potential impacts on water supplies derived from the Sacramento-San Joaquin Delta resulting from subsidence, Earthquakes, floods, changes in precipitation, temperature, and ocean levels, and a combination of those impacts. The bill would require the Department of Water Resources and the Department of Fish and Game to identify, evaluate, and comparatively rate the principal options available to implement certain objectives that relate to the delta or the Sacramento and San Joaquin river systems.The bill would require the departments to jointly report to the Legislature and the Governor
the results of their evaluations and comparative ratings, as specified, no later than January 1, 200 8…"

"…Section 139.2 is added to the Water Code, to read: … The department shall evaluate the potential impacts on water supplies derived from the Sacramento-San Joaquin Delta based on 50-, 100-, and 200-year projections for each of the following possible impacts on the delta:

(1) Subsidence.
(2) Earthquakes.
(3) Floods.
(4) Changes in precipitation, temperature, and ocean levels.
(5) A combination of the impacts specified in paragraphs (1) to
(4), inclusive. "

"…Section 139.4 is added to the Water Code, to read: 139.4. (a) The department and the Department of Fish and Game shall determine the principal options for the delta. (b) The department shall evaluate and comparatively rate each option determined in subdivision (a) for its ability to do the following:

(1) Prevent the disruption of water supplies derived from the Sacramento-San Joaquin Delta.
(2) Improve the quality of drinking water supplies derived from the delta.
(3) Reduce the amount of salts contained in delta water and delivered to, and often retained in, our agricultural areas.
(4) Maintain delta water quality for delta users.
(5) Assist in preserving delta lands.
(6) Protect water rights of the "area of origin" and protect the environments of the Sacramento-San Joaquin river systems.
(7) Protect highways, utility facilities, and other infrastructure located within the delta.
(8) Preserve, protect, and improve delta levees.
(c) The Department of Fish and Game shall evaluate and comparatively rate each option deter mined in subdivision (a) for its ability to restore salmon and other fisheries that use the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.
(d) On or before January 1, 2008, the department and the Department of Fish and Game shall jointly report to the Legislature and Governor, in writing, with regard to the results of the evaluation required by Section 139.2 and the comparative ratings required by subdivisions (b) and (c)…"

DEFINITIONS AND ASSUMPTIONS

The Delta Risk Management Strategy Project was developed, in part, to address the provisions of Sections 139.2 and 139.4 of the CWC. As defined above, the Delta Risk Management Strategy objectives are to: 1) evaluate the potential impacts to the Sacramento-San Joaquin Delta and related assets resulting from various potential stressing events [Sec. 139.2] and 2) develop options (strategies) to protects and reduce the risk to the Delta assets and related beneficiaries.

In the development of the DRMS scope of work the Department defined the risk analysis as Phase 1 and the development of risk reduction options as Phase 2. One of the overall principles used to define a clear and logical relationship between the two phases of the work was that any option developed for the purpose of providing risk reduction, would not be included in the Phase 1 analysis for the projected 50-, 100-, and 200-year Delta. Although, this statement may appear self evident, it is tempting to try to include likely and "obvious" improvements in the Phase 1 analysis. We do recognize, however, that it is highly likely that improvement strategies intending to reduce the risk to the Delta will be implemented based on the risk informed studies included in the DRMS and other efforts.

During Phase 1, various predictive models of future stressing events and their consequences will be estimated. The events resulting from uncontrollable natural and physical processes will be estimated using engineering and scientific tools readily available or by having a broad consensus among the practicing community. Such events include the likely occurrence of future earthquakes of varying magnitude in the region, futures rate of subsidence given continued farming practice, the likely magnitude and frequency of storm events, the potential effects of global climate change (sea level rise, climate change, temperature change) and their effects on the environment. The estimate of risk to the Delta will be made for the 50-, 100-, and 200-year projections. It becomes apparent that projections and/or assumptions defining the future "look" of the Delta be established. The Delta will change in the next 50, 100, and 200 years. The question facing the DRMS project is: what type of Delta one should assume in these future year projections.

Again recognizing that risk-informed decisions will be made to shape the Delta of the future, one must establish for the Phase 1 risk analysis the "business-as-usual" (B-A-U) scenario. Defining a B-A-U Delta is required, to establish a baseline for use in measuring improvements or degradation, and to determine whether 'B-A-U' is sustainable for the foreseeable future. Furthermore, setting a "B-A-U" scenario helps establish an unbiased measure of risk for the Delta and removes potential future speculation as to how the scenario was developed.

One may posit that business-as-usual can only be defined as far as the limited duration of existing agreements, policies, and practices, and hence longer time spans may not be covered by such policies or apply for current practices. We propose to assume for the longer periods of time (50, 100, and 200 years) that current policies and practices are continued, unchanged to the extent possible. Exceptions to this assumption may potentially arise in conditions where the changes in the Delta overwhelm the financial and human resources normally devoted to maintaining the Delta. Examples are presented below to illustrate these potential conditions.

Furthermore, there will be instances where procedures and policies may not exist to define standard emergency response procedure during a major (unprecedented) stressing event in the Delta or restoration guidelines after such a major event. In such conditions, prioritization of action will be based on: 1) existing and expected future response resources, and on highest value recovery/restoration given available resources.

ASSUMPTION EXAMPLES

Below are assumptions illustrating the business-as-usual scenario:

- **Delta Levees –** Levees in the Delta will be maintained in accordance with current maintenance practices as defined by available and reasonably projected resources. That is, it will be assumed that current trends in subvention and special projects funding will continue at the current rate.

- **Emergency Response (Levee Repair)** - During a major disruption to the Delta (earthquake, flood, etc.), the emergency response as it relates to the repair of levees (breaches and non-breach damage) will be limited by the available human and financial resources at the time. As an example, if tens of levees breach during a major event in the near future, DWR will be modeled as having enough resources to reclaim up to 7 islands (for illustration purpose only). The remaining islands will be stabilized to prevent future deterioration. The islands selected for full recovery will be based on the highest benefit for the available resources (public health and safety, agriculture, infrastructure, water supply and water quality, habitat, etc…). Furthermore, during a flood fight, prioritization may be considered, depending on available resources, to protect those islands deemed to have the highest State interest.

- **Delta Improvements** - Delta Improvements in the planning stage will be considered in-place for the B-A-U scenario if those projects are funded and approved in the 2006 calendar year. Planning studies under consideration for future years will not be considered in the Phase 1-Risk Analysis. kely turn out to be prime candidates (low hanging fruits).

- **Land Use -** Urbanization and land use for the Phase 1 B-A-U scenario will be based on the assumption that the primary zone will continue to be a zone free from significant urban development. However, the secondary zone will continue at the current trend based on actual development rates for the past decade.

- **Habitat Restoration** - A certain level of habitat restoration has been underway for ten years. The same rate of restoration will be continued in the B-A-U scenario. The rate assumed is approximately 500 acres per year, until the maximum target area for habitat restoration as established in the CALFED ROD is attained.

- **Water Operations** – Operations following an event in the Delta will be based on current project operating procedures (including reservoir operation guidelines, any formalized standing orders and emergency procedures, pre-action consultation procedures with fisheries agencies or others) and stated priorities as expressed to the DRMS team by the State Water Board staff. These water allocation priorities are first for human health, and second for listed species to the extent mechanisms exist to implement them, and then other uses according to water rights.